

# Wildlife Diversity Program

## Amphibians and Reptiles

### Inventory, Monitoring, and Management of Amphibians and Reptiles in Kentucky

*John MacGregor, KDFWR*



*Barking tree frog/Danna Baxley*

The status of herpetofaunal populations is often difficult to assess due to the secretive and fossorial nature of many reptiles and amphibians. Since several amphibian and reptile species in Kentucky are declining or of uncertain conservation status, an urgent need exists for the availability of comprehensive, up-to-date distribution data, and the initiation of a monitoring program within the state. To adequately address these needs, we sought to: establish sites to monitor species occurrences and populations, gather baseline data on habitat use and condition, determine taxonomic status of several amphibians and reptiles in Kentucky, compile, review, and update existing herpetological information for all Kentucky species, and restore and manage populations listed in Kentucky's Wildlife Action Plan (WAP) as Species of Greatest Conservation Need (SGCN). Throughout 2007, ten sites were created on Wildlife Management Areas (WMA) to

initiate long-term monitoring of these areas. Additionally, significant effort has been dedicated to organizing and entering locality data in an all-encompassing herpetofaunal database. This is intended to be a long-term project which will result in the compilation of baseline herpetofauna data for Kentucky such that appropriate and targeted management actions may occur. In upcoming years, we will extend our monitoring efforts to include additional areas, and we will also begin targeted management and restoration efforts (e.g. translocation of amphibian egg masses to suitable habitats, creation of ephemeral pools).

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.4, Class Reptilia: Prioritized Survey Projects 1, and 2. and Class Amphibia: Priority Survey Projects #1 and 2.**



*Prairie kingsnake/Will Bird*



*Spadefoot toad/Will Bird*

# Bats

## Cave Protection and Monitoring of Federally Listed Bat Species in Kentucky

*Traci Hemberger and John MacGregor, KDFWR*

Kentucky is home to 15 species of bats, 3 of which are federally endangered: the Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*). Currently, the Kentucky Department of Fish and Wildlife Resources (KDFWR), collaborates with agencies like the U.S. Forest Service (USFS), the Kentucky State Nature Preserves Commission (KSNPC), and the U.S. Fish and Wildlife Service (USFWS) to monitor bat populations in Kentucky. The main objectives of this ongoing project are to monitor federally listed bat species and survey selected sites to document bat species present and to gain information about endangered bats or species of special concern.



*Virginia big-eared bat / John MacGregor*

To minimize disturbance to sensitive bat species, KDFWR surveys caves with large bat populations ( $\geq 10,000$ ) biennially. In 2007, we surveyed a total of 50 caves: 37 for hibernating bats in winter and 14 emergence surveys during the summer. Additionally in 2007, summer bat surveys using mist nets and acoustical monitoring were conducted on three Wildlife Management Areas. During these summer surveys, endangered bat species were opportunistically fitted with radio-transmitters and radio-tracked in efforts to determine roosting sites.

When compared to 2005 data, the 2007 hibernacula censuses for Indiana Bats showed an overall population increase of 7.8%, and Kentucky's winter census count of Grey Bats reached an all-time high in 2007. Although winter census numbers for Virginia Big-Eared Bats indicate a short-term decline, the winter population of Virginia big-eared bats in Kentucky exhibits a long-term trend of population growth. Preliminary interpretation of summer census data for Grey Bats and Virginia Big-eared bats indicates an overall increasing trend for Grey Bats and short-term population declines and a long-term stabilizing trend for Virginia Big-eared bats.

It is important to monitor known populations of these species to gather baseline data to ultimately assess population trends to aid in management decisions. Regular monitoring of roosting and maternity sites may also allow for early detection of disturbances resulting in timely corrective conservation measures. Hibernacula surveys in 2008 are currently underway, and we plan to continue monitoring Kentucky's endangered bats in the upcoming year.

**Funding Source:** Cooperative Endangered Species Conservation Fund (Section 6)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Mammalia: Priority Research Project #5. Priority Survey Project #1.**

## Identifying and Protecting Hibernation Roosts for Endangered Bats in Kentucky

*Jim Kennedy, Bat Conservation International; Roy Powers, American Cave Conservation Association; Traci Hemberger, KDFWR*

Kentucky caves once sheltered some of our country's largest, most ecologically important bat populations, especially in large, complex cave systems. Unfortunately, many of these historic roost and maternity sites have been commercialized as tourist attractions, mined for saltpeter, impacted by recreational visits, damaged by vandalism, or rendered unsuitable for bats due to entrance collapses that alter internal temperatures. Within the past few decades, research conducted by Bat Conservation International (BCI) has revealed loss of optimal hibernation roosts as a primary factor in the decline of many bat species, including the Indiana bat (*Myotis sodalis*), a federally endangered species. To restore populations of the Indiana bat and other bat species of conservation concern in Kentucky, we sought to identify and assess previously overlooked hibernation roosts, develop management and restoration recommendations for highest priority sites, and train cavers, biologists and land managers in hibernation cave recognition, documentation techniques, and identification of threats to roosts.

A second goal of this project was to continue restoration work on a high-priority cave in Carter County. Project efforts in 2007 were heavily focused on the restoration of this high priority cave in Carter County. Prior to September 1, 2007, we contracted an excavation company to dig out recent fill from a surface sinkhole directly overlying the end of the cave (a collapsed entrance), hand-excavated the remaining fill connecting into the cave, installed a culvert to prevent soil loss into the cave, backfilled and graded around this culvert, and secured access by installing an adjustable gate to this newly-opened entrance. This project will continue in 2008 with assessment of the restoration potential of 20-30 currently unused bat hibernation sites. Additionally, our collaborative efforts will ensure a broader, stronger coalition of landowners and managers through training which will result in an increase in numbers of hibernating endangered Indiana bats and other species of interest.

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.9, Class Mammalia, Priority conservation actions for terrestrial species guild. Appendix 3.4, Class Mammalia, Prioritized taxa-specific conservation actions. Appendix 3.3, Priority Conservation Action # 97.**



*Indiana bat hibernation cluster / John MacGregor*



## Birds

### Assessing Avian use of Land Enrolled in Conservation Practice 33 (CP33), Conservation Reserve Program

*Shawchyi Vorisek, Kathryn Heyden, and Adam Smith, KDFWR; Wes Burger, Mark Smith, and Kristine Evans, Mississippi State University*

In 2004, the USDA's Conservation Reserve Program (CRP) introduced a new conservation practice called CP33. This conservation practice provides habitat buffers for upland birds, and is designed to supply food and cover for bobwhite quail and other avian species in areas dominated by agricultural row crops. Specifically, CP33 involves planting native warm-season grasses, forbs (wildflowers), legumes, and a limited amount of shrubs around cropland field edges. Although this practice aims to provide food and cover for



*Rusty Blackbird / Kathryn Heyden*

birds, the value of CP33 areas to wildlife has yet to be assessed. To address this gap in our understanding of CP33 areas as wildlife habitat, KDFWR began winter monitoring of avian use of CP33 fields currently enrolled in the Conservation Reserve Program. In 2007, we began investigating the correlation between CP33 practices and avian communities through the establishment of survey transects within 34 CP33 areas and 36 control fields in 15 Kentucky counties. KDFWR collaborated with Mississippi State University to provide maps of each transect within a CP33 contract to observers who conducted avian surveys from February through mid-March 2007. Fifty-nine species were observed with 4,514 individuals counted during these surveys. Five species of greatest conservation concern to Kentucky were observed: American Woodcock (*Scolopax minor*), Northern Bobwhite (*Colinus virginianus*), Red-breasted Nuthatch (*Sitta canadensis*), Rusty Blackbird (*Euphagus carolinus*), and Savannah Sparrow (*Passerculus sandwichensis*). We plan to collect data on these same CP33 and control sites in 2008 such that density estimates and comparisons between CP33 and control fields may be assessed.

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Aves: Priority Research Project #2.**

## Assessing Raptor Populations on Peabody Wildlife Management Area and Throughout Kentucky

*Shawchyi Vorisek, Kathryn Heyden, and Adam Smith, KDFWR; Brainard Palmer-Ball, Kentucky State Nature Preserves Commission; Brian Smith, American Bird Conservancy*

To effectively conserve avian populations, management agencies must have a thorough understanding of population demographics for species of concern. To begin to assess raptor populations in Kentucky, we conducted year-round raptor surveys, with focused efforts at Peabody Wildlife Management Area (WMA), one of western Kentucky's largest wildlife management areas. During the winter, spring migration, breeding, and fall migration seasons from winter 2004 – summer 2007, a total of 331 raptors were observed at Peabody WMA, representing nine species. Over this three-year period, 13 surveys were conducted, and the most abundant raptor species are as follows: Red-tailed Hawks (41.4% of total observed), Northern Harriers (23.3% of total observed) and American Kestrels (13.3% of total observed). In 2007, raptor surveys were conducted using 54 point count survey locations on Peabody WMA; however, earlier years of this study utilized driving survey routes.

In addition to raptor surveys conducted on Peabody WMA, we also used aerial imagery to identify and assess the suitability of potential raptor migration monitoring sites in the vicinity of Pine Mountain. Of five identified sites, we selected the Putney Tower site in Harlan County as the most suitable site, and subsequently conducted a single pilot raptor migration count at this site. As our current data are not sufficient to obtain raptor density estimates for Peabody WMA, we plan to continue raptor surveys on Peabody WMA in 2008, and possibly increase the frequency of these surveys to increase the power of our data. We also hope to initiate further pilot counts at Putney Tower, particularly on favorable days during peak migration.

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Aves: Priority Survey Projects 4 and 7.**



*Red-tailed hawk/Adam Smith*

## Cooperative Cerulean Warbler Forest Management Project

*David Buehler, Patrick Keyser, and Tiffany Beachy, University of Tennessee; Jeff Larkin and Matthew White, Indiana University of Pennsylvania; Amanda Rodewald, Marja Bakermans, and Felicity Newell, Ohio State University; Petra Wood, Greg George, Patrick McElhone, and Matthew Shumar, West Virginia University; Shawchyi Vorisek, KDFWR; Jeff Lewis, U.S. Forest Service, Daniel Boone National Forest*

The cerulean warbler (*Dendroica cerulea*) is a canopy-dwelling neotropical migrant of eastern North America. Over the last 50 years, it has exhibited precipitous declines throughout its range (49.5% since 1966) and has experienced the steepest declines in historically high density areas such as Kentucky (>5.6% annually). Limited information exists concerning cerulean warbler habitat preferences and demography, and even less information is available regarding responses of this bird to various silvicultural treatments (in terms of habitat use and nest success). The goals of this project are to compare pre- and post-treatment data on cerulean warbler populations, habitat use, and reproductive success in areas characterized by different silvicultural treatments (light, moderate, and heavy harvest). Between 15 August 2006 and 1 April 2007, harvest treatments were implemented at seven study sites representing four states (Kentucky, Tennessee, West Virginia, and Ohio). Within each study site, we mist-netted and color-banded cerulean warblers and systematically searched for nests within territories using behavioral cues. Across all study areas and treatments in 2007, 116 nests were monitored and 108 individual cerulean warblers were captured. Of the 116 nests detected, 32 were successful (crude survival rate of 28%), and only nine were associated with the “heavy” silvicultural treatment. We also calculated Mayfield nest success for nests that reached the egg-laying stage. Of 98 nests used in the Mayfield nest calculation, nest success was quite variable, and ranged from 0.4% to 37.4%.

Project activities planned for 2008 include collecting the second season of post-harvest data during the 2008 breeding season, with increased emphasis on nest monitoring and color-marking males. Additionally, we will begin efforts to summarize and analyze data across the partnering states.



*Cerulean warbler female and male / Adam Smith*

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Aves: Priority Survey Projects 5 and 7. Priority Research Project #3.**



## Monitoring Priority Songbird Populations

*Shawchyi Vorisek, Kathryn Heyden, Adam Smith, KDFWR*



*Black and white warbler/Adam Smith*

KDFWR's avian monitoring program is multifaceted and addresses monitoring needs on a statewide and regional basis. The Wildlife Diversity Program addresses priorities within the Commonwealth to meet the needs of the Central Hardwoods, the Appalachian Mountain, the Mississippi Alluvial Valley, and the Southeastern Coastal Plain Bird Conservation Regions. Starting in 1993, KDFWR (and cooperators) established a number of point count stations (PCS) throughout Kentucky as part of a regional Southeast Partners in Flight (PIF) monitoring effort. Throughout the years, several routes have been added to incorporate the various Partners In Flight physiographic regions and Bird Conservation Regions, as well as to adequately sample a diversity of habitat types and species of

concern. To date, the Kentucky PIF program has established 49 point-count survey routes consisting of 915 points with all Bird Conservation Regions in Kentucky represented. In addition to these point-count survey routes, PIF uses breeding bird surveys (BBS) to estimate bird populations, and to identify trends. Kentucky has 46 designated random (BBS) routes and 2 non-random BBS routes, all but seven of which are filled by KDFWR employees or volunteers. KDFWR is also involved in various Monitoring Avian Productivity and Survivorship (MAPS) projects in cooperation with numerous agencies and organizations including: The Institute for Bird Populations, Kentucky State Nature Preserves Commission, Kentucky Department of Parks at Natural Bridge State Resort Park, National Park Service at Mammoth Cave National Park, and the U.S. Fish and Wildlife Service at Clarks River National Wildlife Refuge.

In 2007, KDFWR and cooperators surveyed 45 of the 49 established point-count survey routes and recorded 122 total species (13,771 individuals); additionally, 130 captures of 21 species were obtained from four MAPS stations. The most frequently captured species from these MAPS stations for 2007 (when considering adult captures only) was the Acadian Flycatcher (*Empidonax virescen*) followed by the Kentucky Warbler (*Oporornis formosus*), Hooded Warbler (*Wilsonia citrine*), Worm-eating Warbler (*Helminthos vermivorus*), and Indigo Bunting (*Passerina cyanea*). These monitoring efforts, as well as collaboration between state, national, and international agencies, will continue in 2008 and will contribute to overall avian conservation efforts throughout the continent.



*Scarlet Tanager by Adam Smith*

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Aves:  
Prioritized Survey Projects 3, 4, 5, and 7.**

## Population Status and Reproductive Success of the Bald Eagle in Kentucky

*Shawchyi Vorisek, Kathryn Heyden, Adam Smith and Budd Veverka, KDFWR*



*Bald eagles/Lana Hays*

Kentucky's population of Bald Eagles (*Haliaeetus leucocephalus*) is highest during the winter months when birds from the northern states and Canada migrate south in search of open water on which to hunt and fish. Depending upon the severity of the weather, anywhere from 150-350 bald eagles will winter in the Bluegrass State; however, the state's nesting population is much smaller and is most likely non-migratory, since adults are often seen on-site throughout the year. The number of Bald Eagle nesting territories in Kentucky has steadily increased since the late 1980's, primarily in response to the banning of DDT and a nationwide restoration effort. KDFWR currently uses U.S. Fish and Wildlife Service protocols to monitor Bald Eagle nesting territories and nest success within the state. In January of each year, KDFWR staff, in conjunction with other federal and state agencies and local volunteers, survey as many as 21 routes for wintering eagles and submit the resulting data to the U.S. Department of the Interior as part of a national survey. KDFWR also conducts yearly aerial surveys of nests during the breeding season to identify the productivity of breeding pairs as well as on-the-ground nest visits to determine nest success. In 2007, 183 Bald Eagles were counted during the midwinter eagle survey in Kentucky. Additionally, 6 new Bald Eagle territories were documented, bringing the total number of known nesting territories to 48. With the June 2007 removal of the Bald Eagle from the federal list of threatened and endangered species, new guidelines for management and post-delisting monitoring were developed and implemented to ensure the continued proliferation of this species.

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Aves: Priority Research Project #3.**



## Population Status and Reproductive Success of the Peregrine Falcon in Kentucky

*Shawchyi Vorisek, Kathryn Heyden, Adam Smith, Budd Veverka, KDFWR*



*Peregrine falcon/Budd Veverka*

Peregrine Falcon (*Falcon peregrinus*) monitoring has been ongoing in Kentucky for several decades, and 2007 monitoring efforts followed protocols established by the U.S. Fish and Wildlife Service (USFWS). Each known Peregrine Falcon site was visited a minimum of 4 times during courtship, incubation, hatching, and fledging in order to accurately determine occupancy, nest success, and productivity. We checked potential nest sites for nesting peregrines, and used playback tapes of Peregrine Falcon calls to initiate an audible or visual response. When accessible, we banded young birds with bands obtained from the University of Wisconsin's Raptor Center. Additionally, we worked with property owners and other agencies to erect nest boxes where peregrines were likely to establish a territory, or where existing nest structures result in high young mortality. In 2007, KDFWR monitored

the productivity of 7 Peregrine Falcon pairs in Kentucky, and substantial efforts were dedicated to installation of new nest boxes. KDFWR collaborated with appropriate companies to erect several new nest boxes at generating stations, one nest box at the World Trade Center in Lexington, and an additional three nest boxes at bridge sites. We know that the installation of nest boxes is an important management practice for this species because several observations of female replacement at territories occurred in 2007, indicating a shortage of suitable nest sites.

Although we attempted to detect nesting Peregrine Falcons in cliff areas of the Red River Gorge and Kentucky Palisades, efforts using playback were uneventful. These cliff habitats are extremely difficult to survey; consequently, we are not discounting the possibility of the existence of a cliff-nesting pair of Peregrine Falcons in Kentucky. Efforts to survey and monitor Peregrine Falcons in Kentucky will continue in 2008, and specific efforts to network with the public, birders, and rockclimbers will be initiated in hopes of identifying territorial Peregrine Falcons in cliff habitats.



*Peregrine falcon chick/Budd Veverka*

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Aves: Priority Survey Project #4. Priority Research Project #3.**

## Vocalizations of Adult Turkey Vultures as They Arrive at Nest Sites During the Nesting Season

*William Lynch, KDFWR*

The New World vultures, including the Turkey Vulture, are thought to be voiceless. Nonetheless, they do produce sounds in certain social contexts, such as responses to stress and conspecific aggression. Beginning in 2004, Turkey Vulture adult vocalizations and nest site observations were recorded at three nest sites in Kentucky (totaling 305 arrival calls). Unlike the long, hissing vocalizations familiar to ornithologists, these nest site vocalizations sound like a cough or grunt, average 0.283 seconds in length and are between 100 and 3400 Hz in frequency. Furthermore, young vultures respond to the adult vocalization by hissing and approaching the next entrance. These adult vocalizations could possibly serve as a signal to young vultures that an adult is present with food, and the response by young vultures may inform the adult of the location of the nestlings. In order to further clarify the use of the arrival call by the parent and the respective response by young vultures, further recordings, nest monitoring, and call analysis will be conducted in 2008.



*Black vulture at nest site / Bill Lynch*



# Mollusks

## Development of In Vitro (artificial) Laboratory Culture Methods for Rearing Juvenile Freshwater Mussels

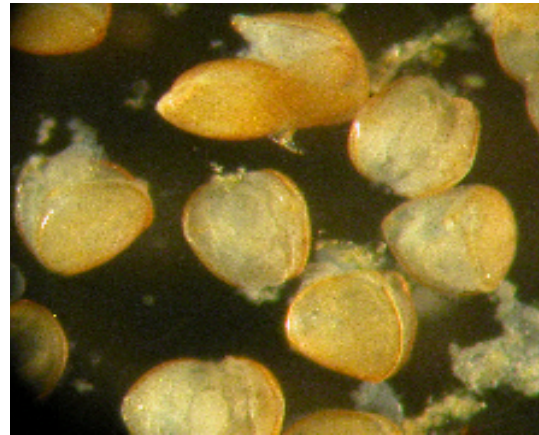
Monte McGregor, KDFWR; James Alexander, University of Louisville



Incubation chamber / Monte McGregor

nature of this taxonomic group, research regarding successful artificial culture techniques is desperately needed. The development of these artificial methods may allow for a new and more effective means of propagating freshwater mussels to be used in restoration efforts throughout Kentucky. The three main goals of our project are: 1) to develop an artificial method of transforming mussels in cell culture media; 2) to compare growth and survival of juveniles transformed in media verses those transformed with host fishes; and 3) to evaluate the feasibility and success of developed in vitro laboratory culture methods. This project is a 3-year project which began in July, 2007. Thus far, adult mussels of target species have been collected and maintained at the Center for Mollusk Conservation, and we have successfully transformed five new mussel species, including *Lampsilis abrupta*, without fish hosts. Throughout 2008, we will continue the process of transporting gravid female mussels to the University of Louisville, extracting glochidia from these females, and using cultured media to grow-out juvenile mussels. This project provides the tools necessary to assess the most effective method of propagating freshwater mussels, without having to rely on host fishes, which may potentially produce larger numbers of mussels for future restoration efforts.

Although in vitro metamorphosis of glochidia has been successful with several generalist mussel species (e.g. *Ligumia recta*, *Lampsilis siliquoidea*, and *Utterbackia imbecillis*), this propagation technique currently lacks success with specialist mussel species. Specialist mussel species tend to use very specific hosts or require pH, ionic, or gaseous conditions (partial pressure O<sub>2</sub> and CO<sub>2</sub>) specific to the external cells of fish. Of 103 recognized mussel species known from Kentucky, 12 species are presumed extinct and another 22 are listed by the U.S. Fish and Wildlife Service as endangered. Given the imperiled



Giant floater juveniles produced from in vitro methods- without fish host / Monte McGregor

**Funding Source:** State and Tribal Wildlife Grant (SWG)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Bivalvia: Priority Research Project #1.**



## Endangered Species Recovery in Kentucky: Restoring the Freshwater Mussel via Population Augmentation

Monte McGregor, Jacob Culp, Adam Shepard, and Fritz Vorisek; KDFWR



Nursery system for rearing juvenile mussels/Monte McGregor

Currently, over 60 species of mussels (including four federally endangered species) are being held in captivity at the Center for Mollusk Conservation for use in propagation experiments and/or surrogates for endangered mussels. During 2007, survival for all mussels was 70 – 80%, and several species produced viable glochidia during the past year. The Center for Mollusk Conservation is now capable of culturing rare and imperiled mussels, and many important milestones were achieved in 2007. On July 5,

biologists from the Center were able to release 1,100 juvenile endangered pink mucket (*Lampsilis abrupta*) mussels into the Green River; these mussels were propagated, raised and tagged at the Center for Mollusk Conservation. In addition, after successfully rearing the fatmucket, *Lampsilis siliquoidea*, for almost two years in captivity using its largemouth bass fish host, biologists released over 100 fatmuckets (each the size of a quarter) in Elkhorn Creek near Frankfort, Kentucky. Although this species is a common mussel in Kentucky, it was used as a surrogate mussel for other rare mussels, such as the pink mucket, to refine propagation and grow-out techniques. Few groups have been able to grow mussels in a controlled environment to a tagable size for release in the wild. This is an important step for all mussels in Kentucky, as new techniques will be patterned from the fatmucket success. These two mussel releases are the 2<sup>nd</sup> and 3<sup>rd</sup> releases of mussels into Kentucky waters (the first occurred May, 2005 with 151 juvenile Cumberland bean, *Villosa trabalis*, mussels released into Buck Creek).

**Funding Source:** United States Fish and Wildlife Service (USFWS) Cooperative Agreement

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Bivalvia: Priority Research Projects #1, #2, #3. Appendix 3.3, Priority Conservation Action #180.**

## Evaluating the Present Status of Mussel Resources in Kentucky: Quantitative and Qualitative Survey and Monitoring Efforts

Monte McGregor, Jacob Culp, Adam Shepard, and Fritz Vorisek, KDFWR

In fall 2006 and spring/summer/fall 2007, biologists with the Kentucky Department of Fish and Wildlife Resources conducted qualitative and quantitative mussel surveys of 29 sites in Kentucky waters. All sites were surveyed using snorkeling, scuba diving, and/or hand picking. At each site, live and fresh dead mussels were identified, tallied, and returned to the stream. Sixty-two species were observed at the selected sites, and ten federally endangered species were detected including: fanshell, *Cyprogenia stegaria*; rough pigtoe, *Pleurobema plenum*; fat pocketbook, *Potamilus capax*; Cumberlandian combshell, *Epioblasma brevidens*; tan riffleshell, *Epioblasma walkeri*; orangefoot pimpleback, *Plethobasus cooperianus*; littlewing pearlymussel, *Pegias fabula*; clubshell, *Pleurobema clava*; Cumberland bean, *Villosa trabalis*; and pink mucket, *Lampsilis abrupta*. Of the 29 sites, surveyed, 15 were identified as potential augmentation sites, and all 15 of these augmentations sites were identified as high priority areas for mussel recovery. Eleven of these 29 surveyed sites were quantitatively surveyed to establish monitoring sites, track recruitment, and assess age/size class distributions for rare and common mussels. In addition, we used Passive Integrated Transponders (PIT tags) to permanently mark dozens of wild-caught mussels for future monitoring of individuals using our newly acquired PIT tag reader. Continued survey and monitoring efforts, and continued efforts to permanently mark individual mussels using PIT tags, are planned for 2008.



Pink Mucket /KDFWR

**Funding Source:** Cooperative Endangered Species Conservation Fund (Section 6)

**Comprehensive Wildlife Conservation Strategy: Appendix 3.2, Class Bivalvia: Priority Survey Projects 1 and 2.**



Green River mussel assemblage/Monte McGregor